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Davidson County Child Death Review

Data Report 2018



Metro Public Health Dept
Nashville / Davidson County

Protecting, Improving, and Sustaining Health

Davidson County Child Death Review Data Report, 2018

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Preface

Mission

The mission of the Davidson County Child Death Review Team (CDRT) is to provide a better understanding of how and why children die in order to find ways to help reduce the number of preventable child deaths. This is accomplished through comprehensive and multidisciplinary reviews of the circumstances surrounding each death.

Background

The CDRT is empowered by State statute (T.C.A. 68-42-101) and Mayoral Executive Order to conduct reviews of deaths to resident children under the age of 18 years in order to achieve the following goals:

1. Ensure an accurate inventory of child fatalities by demographics, geographic locations, causes, and manners.
2. Support adequate child death investigations.
3. Enable multi-agency collaboration, cooperation, and communication at the state and local levels to address child fatalities.
4. Analyze patterns and trends in total and cause-specific child fatalities with greater emphasis on preventable deaths related to abuse and neglect, unsafe sleeping environments, and inadequate medical care or public health services.
5. Enhance community awareness of the epidemiology of childhood mortality, and public understanding of why and how children die.
6. Develop recommendations and community-based prevention initiatives to reduce child fatalities among Davidson County residents.

About This Report

This report first summarizes the key issues, recommendations, and actions resulting from the CDRT's detailed review of each child death occurring in Davidson County during 2018. The report then presents quantitative data on the epidemiology of child fatalities with an emphasis on describing the cause and manner of death, preventability, context, and modifiable risk factors associated with the deaths.

Recommendations and Actions Resulting from CDRT Reviews

Each year, based on the findings of child death reviews, the CDRT makes recommendations for policy, infrastructure, and service changes in an effort to prevent future childhood mortality. The Tennessee Department of Health (TDH) State Child Fatality Team consolidates recommendations from all teams across the state and uses them to guide legislative, programmatic, and policy agendas for the State of Tennessee.

At the local level, the Davidson County CDRT facilitates the implementation of recommendations through direct interaction with the agencies and organizations involved, or through contacts and partnerships with appropriate community groups. Recommendations and actions made by the CDRT based on the review of child deaths occurring in 2018 are presented in Table 1 below.

Table 1. Recommendations and Actions of the Davidson County CDRT, 2018

Identified Issue	Recommendation/Action
<ul style="list-style-type: none"> Infant Safe Sleep: Reviews revealed cases of infant sleep-related death occurring while the caregiver was impaired from legitimate prescription drug use. The Team suggested that pharmacies could provide another distribution channel for safe sleep information. 	<ul style="list-style-type: none"> The Davidson County CDRT submitted a recommendation to the State Child Death Review Team (SCDRT). It reads: Between 2015 and 2017, 10% of sleep-related infant deaths involved a drug-impaired adult. Reviews revealed cases of caregiver impairment resulting from legitimate prescription drug use. Considering this, the Davidson County CDRT recommends that the Tennessee Department of Health (TDH) partner with the Tennessee Pharmacists Association (TPA) to create educational materials on safe sleep for distribution in pharmacies, with a special emphasis on patients picking up medications that can cause excessive sedation. The content of the educational materials should stress the importance of safe sleep practices and the dangers of not following those practices, especially when a caregiver is under the influence of medication that can cause impairment.
<ul style="list-style-type: none"> Trauma-Informed Systems: The CDRT noted multiple instances of mothers experiencing trauma-inducing circumstances, which has 	<ul style="list-style-type: none"> The presentation walked the Team through the care of a hypothetical woman if all systems in Davidson County were trauma-informed. Such a system of care meets

been linked to poor health and birth outcomes. The Team requested a hypothetical case study to determine what a mother's care would look like if Davidson County had fully implemented trauma-informed systems.

people where they are in life regardless of age or circumstance, provides services in such a way that earns trust, promotes safety, involves patients in their own care and treatment, and communicates with compassion. The Team will use trauma-informed care as a framework to evaluate the circumstances surrounding child deaths and craft future recommendations.

- **Trauma-Informed Systems:** Case reviews revealed missed opportunities for school students to receive needed referrals to mental health and other social services for exposure to trauma or patterns of disruptive behavior.

- Metro Nashville Public Schools (MNPS) implemented two programs designed to provide trauma-informed care to students in need. 1. *Handle with Care* is a partnership between MNPS and the Metro Nashville Police Department (MNPd) intended to notify schools that a child was involved in an incident. No details are provided, but the notification allows school social workers to provide follow-up and allows the school to be on the alert for uncharacteristic behavior and intervene appropriately. 2. MNPS shifted its approach to attendance and truancy (5 or more unexcused absences in a school year) to a tiered system that allows students with more absences to receive higher levels of intervention. Schools are increasingly accountable for attendance, and each school developed an attendance team. Schools are also distributing an attendance information campaign.

- **Injury Prevention:** The CDRT reviewed a case of heat-related death due to a child being left unattended in a hot vehicle. Although a relatively rare occurrence (2 to 3 deaths per year in Tennessee), these deaths are entirely preventable.

- The CDRT sent a recommendation to the SCDRT. It reads: Considering that two to three children lose their lives in Tennessee each year due to environmental hyperthermia as a result of being left unattended in hot vehicles, the Davidson County CDRT recommends that TDH partner with the Tennessee Department of Transportation (TDOT) to offer annual reminders and education regarding the dangers of leaving children and animals unattended in vehicles. These reminders should occur regularly
-

-
- **Injury Prevention:** The CDRT noted that in the past 5 years, they have reviewed 2 deaths where black mold was mentioned as an environmental concern. Both deaths were sleep-related, and the mold exposure was not directly responsible for the death, but the Team wanted to know more about mold remediation and options for residents of Metropolitan Development and Housing Authority (MDHA) properties.

once the weather gets warm.

- In MDHA properties, complaints of suspected mold are assessed by staff within 24 hours. If the growth is easily identified as something other than mold, then either the tenant or a contracted environmental firm is asked to clean the area. Air quality in the unit is tested for levels of mold spores over a 5-day period. If results indicate elevated mold spores, the resident is relocated to allow for remediation. MDHA indicated that in many instances, education for the complainant would be beneficial as most growths are labeled mold, when they are, in fact, something else. The Team will use this information as a guide for future recommendations.

Key Findings

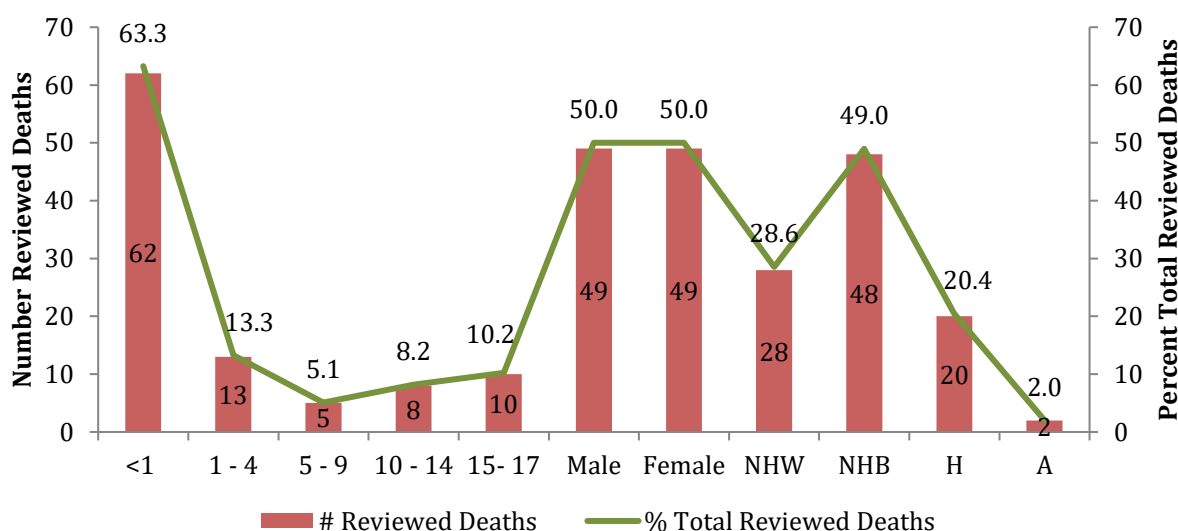
- In 2018, the CDRT reviewed 98 child deaths. Most of these deaths (62 deaths, 63.3%) occurred to infants under 1 year of age.
- The overall mortality rate for children aged 0 to 17 years in Davidson County in 2018 (75.9 deaths per 100,000) was not statistically different from the previous year. It was significantly higher than the rates for the State of Tennessee and the nation.
- The CDRT determined that 31.6% of the child deaths reviewed in 2018 were preventable. These high percentages of preventable deaths highlight the need for a careful and thoughtful review of each death to understand the risk factors and circumstances leading to death, and to identify opportunities for prevention.
- In 2018, Non-Hispanic Black (NHB) children were nearly 2 times more likely to die than Non-Hispanic White (NHW) children. This disparity was persistent over the 5-year period from 2014 to 2018.
- Nearly 20% (12 deaths) of infant deaths reviewed in 2018 were sleep-related, of which almost all (11 deaths, 91.7%) occurred when infants were placed to sleep in unsafe bedding.
- Of the total reviewed deaths, 12 deaths (12.2%) resulted from unintentional injuries, including suffocation (7 deaths), drowning (3 deaths), motor vehicle crashes (1 death), and environmental hyperthermia (1 death).
- There were 13 deaths (13.3% of total reviewed deaths) related to violence (i.e., homicides and suicides). Most of these deaths occurred to males (9 deaths), teens aged 15 to 17 years (8 deaths), and NHB children (7 deaths).
- Nearly a quarter of the reviewed deaths (24 deaths, 24.5%) showed some evidence of abuse, neglect, or negligence. In most of these deaths (18 deaths, 75%), the perpetrator was the child's biological parent or primary caregiver.

Executive Summary

Overall Child Mortality

The CDRT reviewed 98 deaths that occurred to children in Davidson County in 2018. The first year of life appears to be the most vulnerable for Davidson County's children, accounting for 63.3% of all deaths under the age of 18 years (Figure 1). Children aged 1-4 years and 15-17 years had the next highest percentages of deaths at 13.3% and 10.2%, respectively. Deaths were evenly distributed between males and females (50%).

Figure 1. Distribution of Reviewed Deaths by Age, Sex, and Race/Ethnicity, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

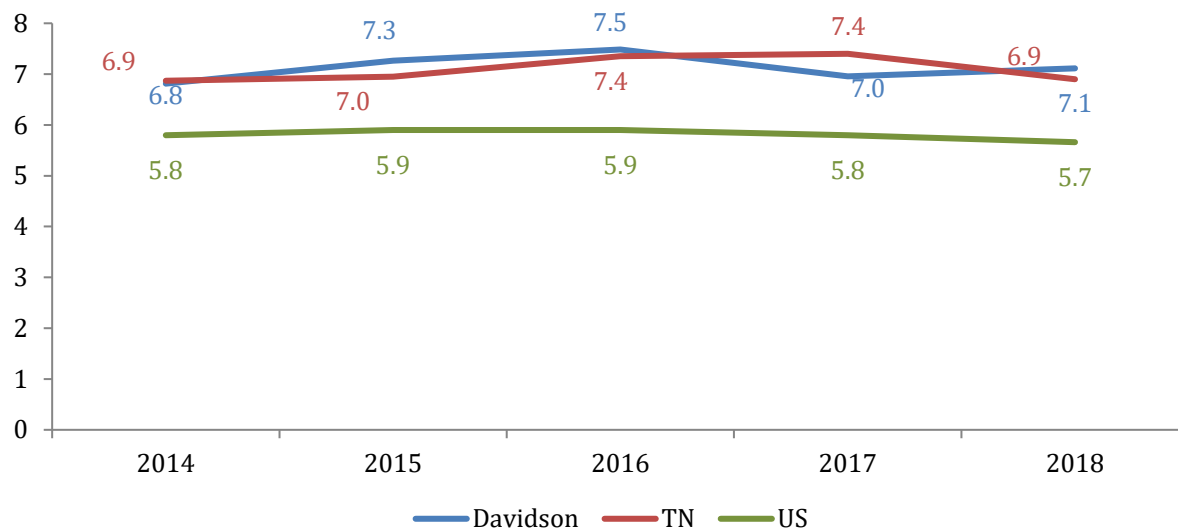
In 2018 there were persistent racial and ethnic disparities in child fatalities within the county (Figure 1). NHB children contributed a disproportionately higher percentage of the total reviewed deaths compared to NHW children (49% vs. 28.6%, respectively), followed by Hispanic children (20.4%).

Between 2014 and 2018, the overall annual mortality rates for NHB children were 1.5 to 2.6 times higher when compared to NHW children. The mortality rates for both NHB and NHW children increased during this period. For NHB children, the rate increased by 12.8% from 101.5 per 100,000 in 2014 to 114.5 in 2018. For NHW children, the rate increased by 18.6% from 48.4 per 100,000 in 2014 to 57.4 in 2018.

Infant Mortality

In 2018, the infant mortality rate was 7.1 deaths per 1,000 live births, which was not significantly different from the previous year (7.0 deaths per 1,000 live births). The five-year (2014-2018) trend in infant mortality rates in Davidson County was stable, and rates were similar to those for the State of Tennessee. However, during this period, infant mortality rates in Davidson County were consistently higher than national rates. In 2018, for example, the infant mortality rate in Davidson County (7.1 per 1,000 births) was 24.6% higher than the rate for the nation (5.7 per 1,000 births) (Figure 2).

Figure 2. Infant Mortality Rates per 1,000 Live Births, Davidson County, Tennessee, and the US, 2014-2018



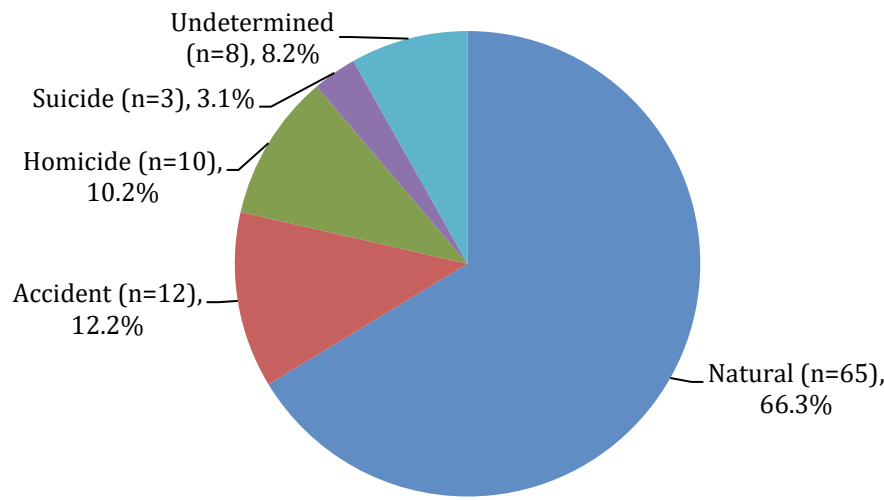
Data Sources: Vital records provided by Tennessee Department of Health; Tennessee and US rates from CDC Wonder.

Between 2014 and 2018, mortality rates among NHB infants increased 16.5% from 12.1 to 14.1 deaths per 1,000 live births, while the rates among NHW infants decreased 6.8% (from 4.4 to 4.1 per 1,000 live births). Additionally, the ratio between NHB and NHW infant mortality increased from 2.8 in 2014 to 3.4 in 2018, indicating growing disparities during this period.

Manner of Death

In 2018, most reviewed deaths in Davidson County resulted from natural causes (66.3%), followed by accidents (12.2%), homicides (10.2%), and suicides (3.1%). Additionally, 8.2% of deaths were categorized as undetermined because their cause and manner remained unknown after an extensive autopsy and death scene investigation (Figure 3).

Figure 3. Percent of Reviewed Deaths by Manner of Death, Davidson County, TN, 2018



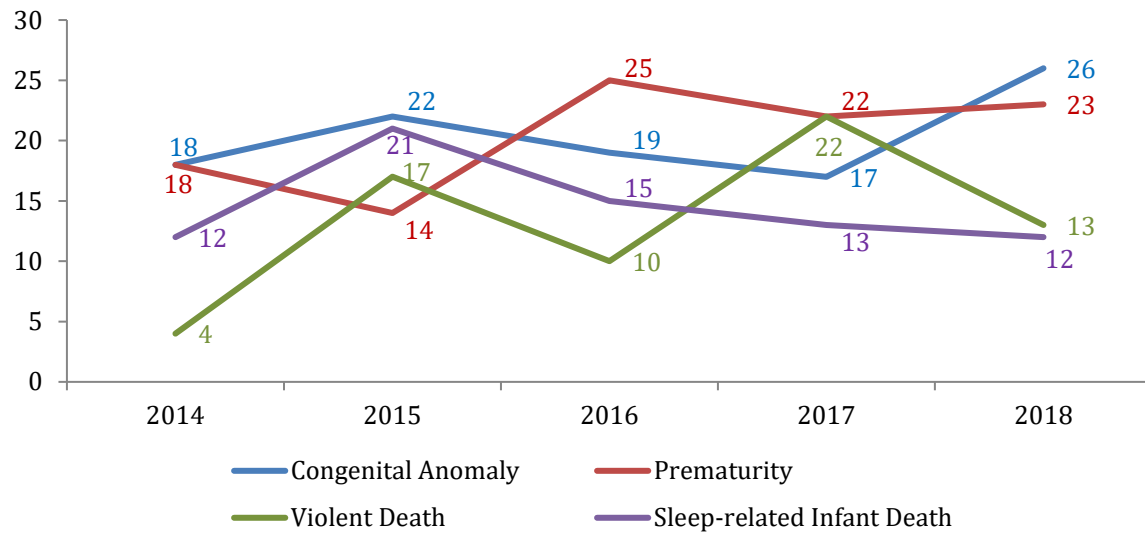
Data Source: MPH, Child Fatality Review Database System

Cause of Death

During 2018, of the 65 deaths classified as natural, congenital anomalies (40%) accounted for the highest percentage, followed by prematurity (35.4%), and cancer (4.6%). Among the 12 deaths categorized as accidental, suffocation was the leading cause (58.3%) followed by drowning (25%). Firearms were the leading cause of death for homicides (8 of 10 deaths; 80%), and strangulation accounted for the majority of suicide deaths (2 of 3 deaths).

Figure 4 displays the 5-year trend in the number of infant and child deaths for major causes of death from 2014 through 2018. During this period, the number of sleep-related infant deaths peaked in 2015 (21 deaths), followed by a steady decline in the subsequent years. **Compared to 2015, the number of sleep-related deaths in 2018 decreased by 42.9%.** Deaths due to prematurity peaked in 2016 (25 deaths) and remained stable in the following years. The number of deaths due to congenital anomalies increased significantly from 18 deaths in 2014 to 26 deaths in 2018, representing a 44.4% increase. Violent deaths, defined as homicides and suicides together, reached the highest level in 2017 with 22 deaths, then declined 41% to 13 deaths in 2018. However, the number of violent deaths in 2018 represented an over 3-fold increase compared to 2014 (4 deaths).

Figure 4. Number of Reviewed Deaths for Selected Causes, Davidson County, TN, 2014-2018



Data Source: MPHD, Child Fatality Review Database System

Introduction

The Child Death Review process brings together a multidisciplinary team to discuss child deaths in the community to understand why children die and decide what actions should be taken to prevent future deaths. Information on each death is collected from a wide range of agencies and medical providers and carefully reviewed. The process allows for the identification of inefficiencies and gaps in medical care and social support systems, as well as understanding the broader issues in the community and modifiable risk factors associated with the deaths.

Data Sources and Data Analyses

This report is primarily based on the 2018 child death review data for Davidson County. Child mortality is defined as the death of a child between 0 and 17 years of age. Infant mortality is defined as a death occurring within the first 12 months of life.

For the current analysis, the death of a child was reviewed if:

- The child resided in Davidson County at the time of death;
- The child was between 0 and 17 years; and
- The death occurred in the State of Tennessee.

In addition, infant deaths were reviewed if they were born on or after 23 weeks gestation or were born at a weight equal to or greater than 500 grams.

On average, 86% of all child deaths occurring in Davidson County meet the above criteria and are reviewed. As such, data presented in this report might be slightly different from the data in other published reports based on different data sources (e.g., vital records).

Data from child death reviews were descriptively analyzed to provide the frequency distribution of deaths by demographic characteristics (i.e., age, gender, race/ethnicity), and by the manner and cause of death.

In addition, mortality rates per 100,000 children and infant mortality rates per 1,000 live births were based on total deaths recorded in the mortality and natality files for Davidson County. The rates for 2018 were compared with the rates for 2014, 2015, 2016, and 2017 to examine the 5-year trend from 2014 through 2018. The geographic distribution of child deaths was also analyzed to determine where the deaths were concentrated within Davidson County.

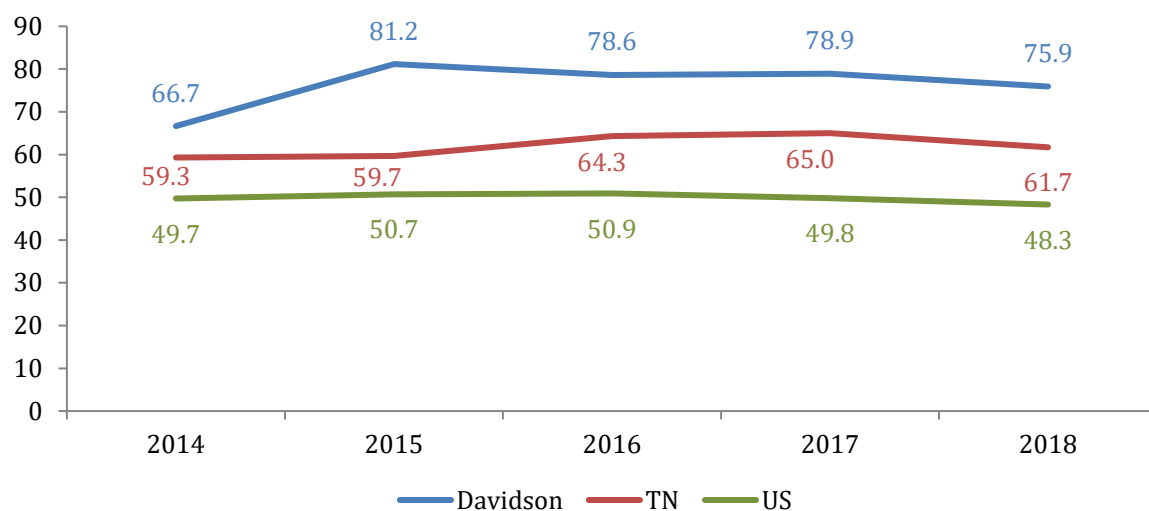
Further details regarding the analysis can be found in the Technical Notes section of this report.

Child Mortality

Overall Mortality

The overall mortality rates for children aged 0 to 17 years in Davidson County in 2018 were almost unchanged since 2016 and were 13.8% higher than the rate in 2014 (Figure 5). For the 5-year trend from 2014 to 2018, Davidson County consistently experienced a higher child mortality rate when compared to the rates for the State of Tennessee and the nation. In 2018, the rate for Davidson County was 23% higher than the rate for Tennessee and 57% higher than the national rate.

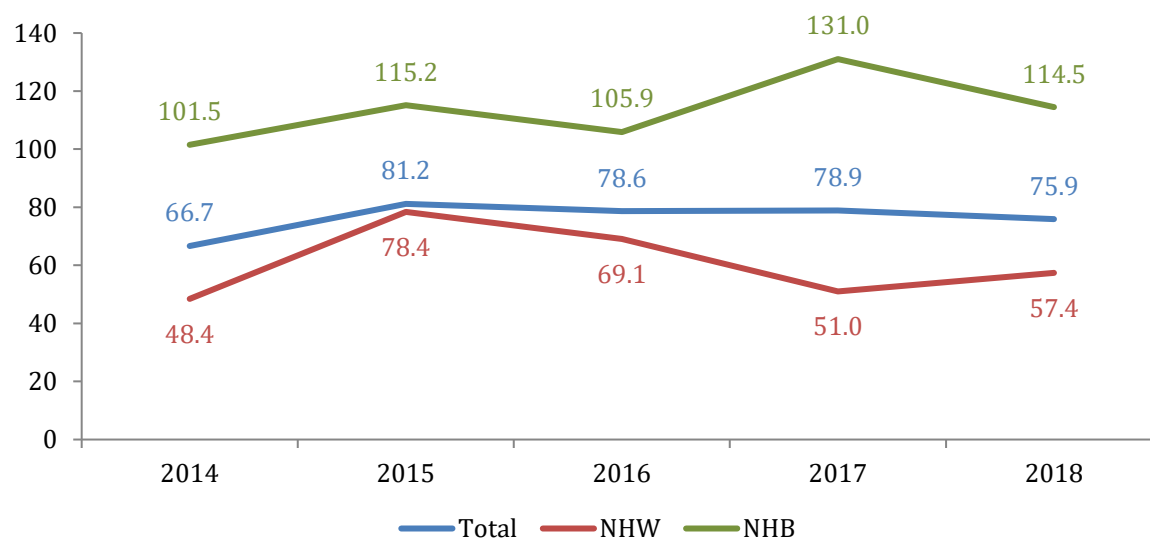
Figure 5. Mortality Rates per 100,000 Children Aged 0-17 Years, Davidson County, Tennessee, and the US, 2014-2018



Data Sources: Vital records provided by Tennessee Department of Health; Population based on American Community Survey 1-year estimates; Tennessee and US rates from CDC Wonder.

Racial and ethnic disparities in childhood mortality in Davidson County were persistent during the 5 years from 2014 to 2018 (Figure 6), with NHB children dying at a rate that was, on average, 1.9 times higher than the rate of NHW children. Additionally, mortality rates for both NHB and NHW children increased between 2014 and 2018 – 12.8% for NHB children (101.5 to 114.5 per 100,000), and 18.6% for NHW children (48.4 to 57.4 per 100,000).

Figure 6. Mortality Rates per 100,000 Children Aged 0-17 Years by Race/Ethnicity, Davidson County, TN, 2014-2018



Data Sources: Vital records provided by Tennessee Department of Health; Population based on American Community Survey 1-year estimates; Hispanic rates not included due to small numbers.

Manner of Death

Manner of death is a way of categorizing deaths based on the circumstances under which a death occurred. This is assigned by either the physician certifying the death or the medical examiner conducting the autopsy. Each death is classified as one of the following manners: Natural, Accident, Homicide, Suicide, or Undetermined.

Of the 98 deaths reviewed in 2018, 65 deaths (66.3%) was classified as natural, 12 deaths (12.2%) as accidental, 10 deaths (10.2%) as homicide, and 3 deaths (3.1%) as suicide. When data were stratified by sex, age, and race/ethnicity, natural causes remained the leading manner of death in every subgroup, except for teens aged 15 to 17, among whom homicide and suicide were the leading manners of death (Table 2).

Table 2. Number of Reviewed Deaths by Manner of Death among Children Aged 0-17 Years, Davidson County, TN, 2018

Manner of Death						
	Natural (n=65)	Accident (n=12)	Suicide (n=3)	Homicide (n=10)	Undetermined (n=8)	Total (n=98)
Age Group						
<1 yr	47	8	0	0	7	62
1-4 yrs	8	3	0	1	1	13
5-9 yrs	3	0	0	2	0	5
10-14 yrs	6	0	1	1	0	8
15-17 yrs	1	1	2	6	0	10
Race/Ethnicity						
NHB	29	7	1	6	5	48
NHW	19	4	2	2	1	28
Asian	2	0	0	0	0	2
Hispanic	15	1	0	2	2	20
Sex						
Male	28	7	2	7	5	49
Female	37	5	1	3	3	49
Data Source: MPHD, Child Fatality Review Database System						

Data Source: MPHD, Child Fatality Review Database System

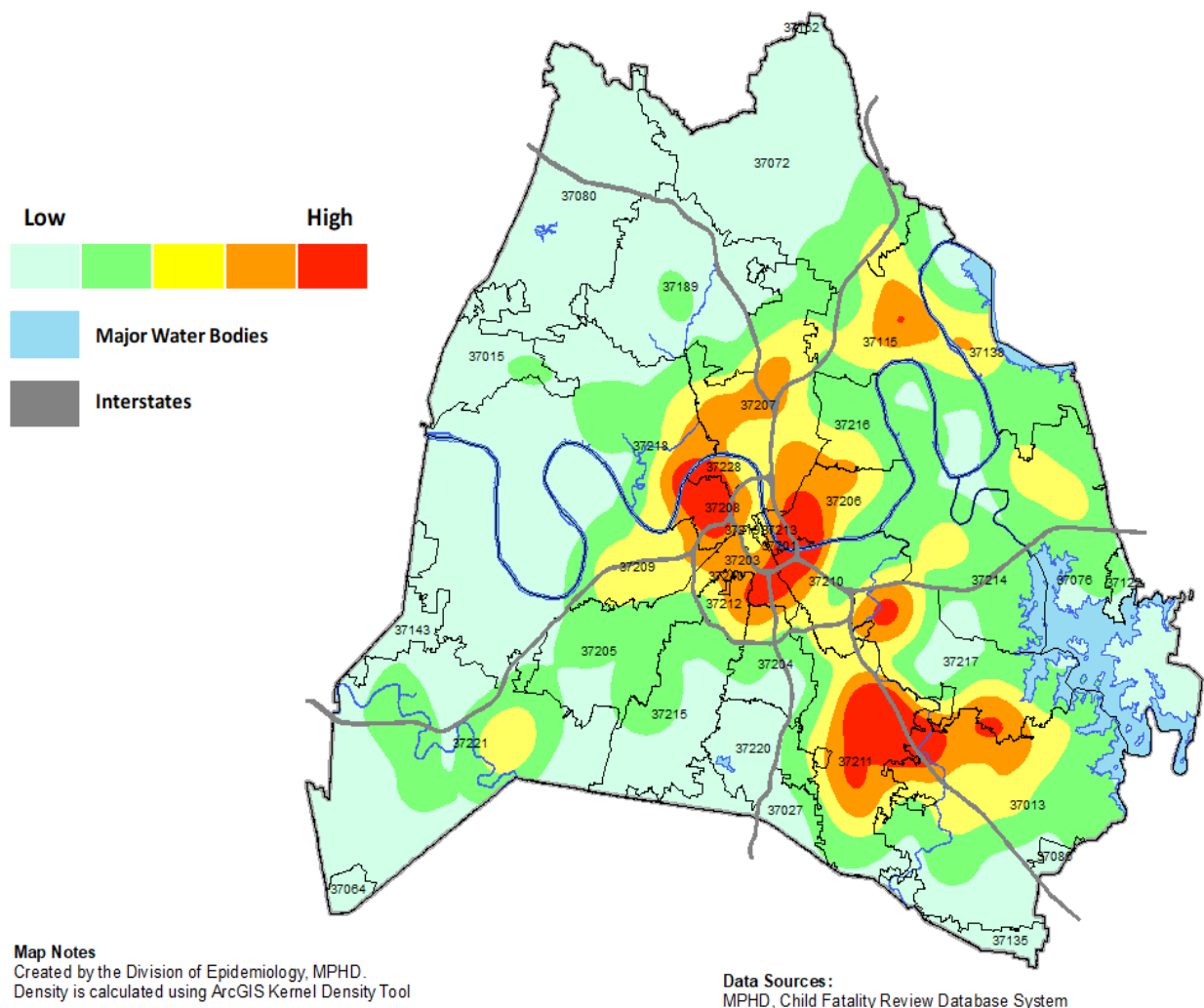
As shown in Table 2, there were marked differences in the demographic distribution of child fatalities by manners of death. While infants accounted for the highest percentages of natural (47 of 65 deaths, 72.3%) and accidental deaths (8 of 12 deaths, 66.7%), teens aged 15 to 17 years contributed the highest percentage of suicide (2 of 3 deaths, 66.7%) and homicide deaths (6 of 10 deaths, 60%). Except for deaths due to suicide, NHB children consistently had the highest number of deaths when compared to other racial/ethnic groups irrespective of the manner of death.

Deaths classified as undetermined accounted for 8.2% of all deaths reviewed in 2018. Infants comprised the greatest number of deaths with an undetermined manner (7 of 8 deaths, 87.5%), primarily due to unsafe sleeping environments (6 of 7 deaths, 85.7%; data not shown).

Geographic Distribution of Child Mortality

The burden of child mortality is not uniformly distributed across the county. Figure 7 displays the incident density of reviewed child fatalities in Davidson County based on 5-year aggregate data from 2014 to 2018. Areas with the highest concentrations of child deaths are shaded in red, while those with the lowest are shaded in light green. As the map indicates, areas with the highest density of child mortality were located in the center and southeast parts of the county. In addition, another smaller area with a high density of child mortality is found in the northeastern part of the county.

Figure 7. Map of Incident Density of Child Deaths According to Resident Address at the Time of Death, Davidson County, TN, 2014-2018



Infant Mortality

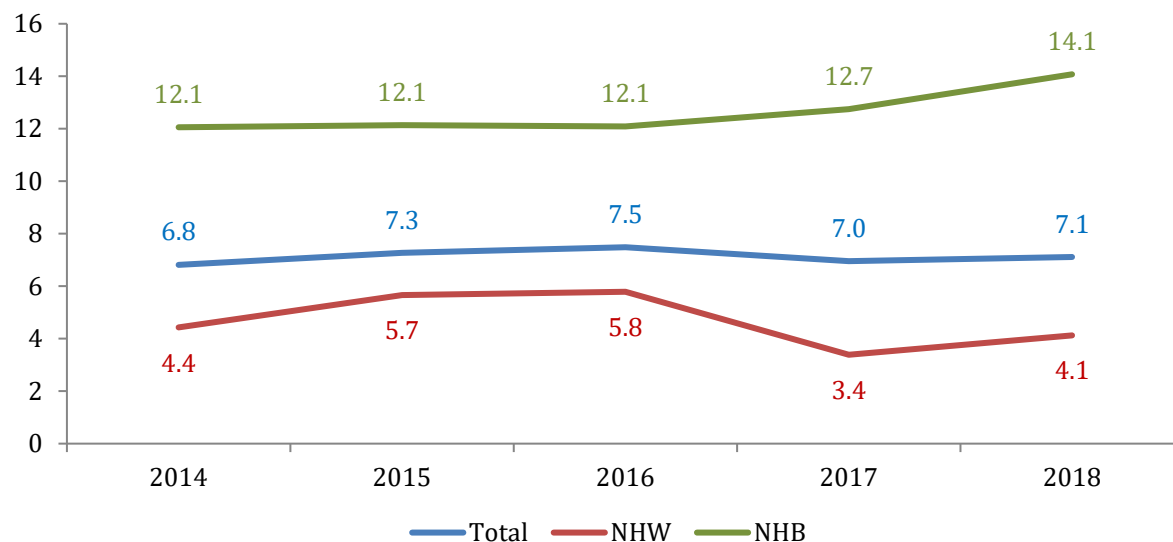
Overall Infant Mortality

The CDRT reviewed 62 infant deaths in 2018, which accounted for 63.3% of all reviewed deaths. As presented in Figure 2, the infant mortality rate in Davidson County was 7.1 per 1,000 live births in 2018, which was virtually unchanged from the previous year (7.0 per 1,000 live births).

From 2014 to 2018, infant mortality rates in Davidson County were stable and similar to the rates for the state of Tennessee, but the rates consistently exceeded the national rates during this 5-year period. In 2018, for example, Davidson County's rate was 24.6% higher than the national rate (Figure 2, page 12).

As shown in Figure 8, between 2014 and 2018, racial and ethnic disparities in infant mortality were persistent. During this period, the infant mortality rate for NHB infants increased 16.5% (from 12.1 to 14.1 per 1,000 live births), while the rate for NHW infants decreased 6.8% (from 4.4 to 4.1 per 1,000 live births). On average, mortality for NHB infants was 2.8 times higher than that for NHW infants. In 2018, mortality rates for both NHB and NHW infants increased from the previous year – 11% for NHB infants (12.7 to 14.1 per 1,000 live births) and 20.6% for NHW infants (3.4 to 4.1 per 1,000 live births).

Figure 8. Infant Mortality Rates per 1,000 Live Births by Race/Ethnicity, Davidson County, TN, 2014-2018



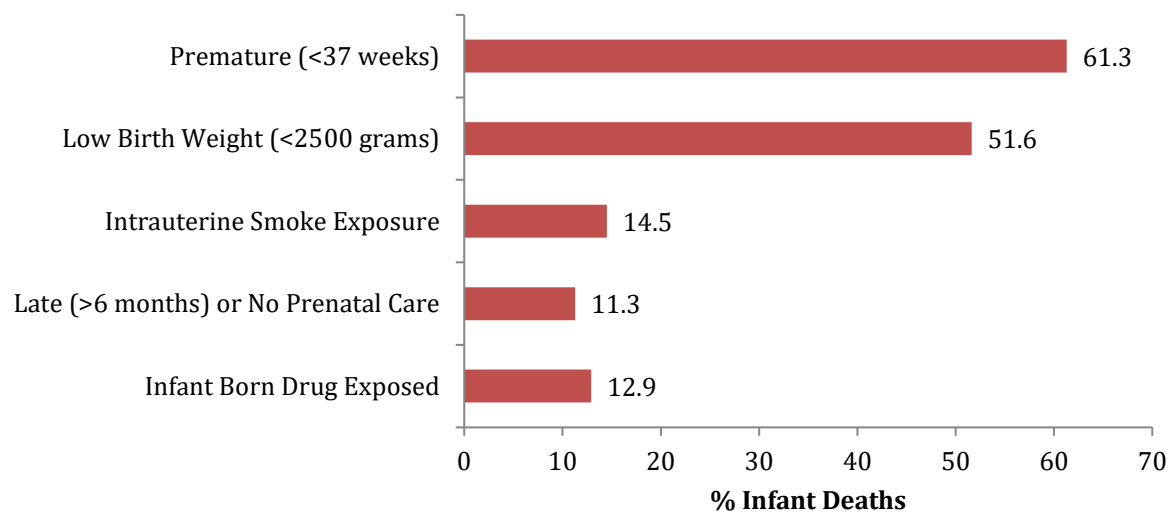
Data Sources: Vital records provided by Tennessee Department of Health. Hispanic rates not included due to small numbers.

Factors Associated with Infant Deaths

It is well established that infant vitality is influenced by a range of factors such as maternal health and behaviors, maternal substance use (e.g., smoking, drug abuse), access to pre- and post-natal care, issues related to labor and delivery, and housing conditions. This section of the report presents data on factors associated with infant deaths based on information obtained from CDRT reviews, irrespective of the cause and manner of death.

As shown in Figure 9, prematurity and low birth weight were the predominant risk factors, which occurred in 61.3% and 51.6% of the total reviewed infant deaths, respectively. These percentages mirror the high rate of preterm birth (10.4%) and low birth weight (9.2%) infants in Davidson county. Additionally, 14.5% of reviewed infant deaths were associated with intrauterine smoke exposure, and 12.9% were born drug-exposed. Having late or no prenatal care was noted among 11.3% of mothers with infant deaths, which was higher than the percentage of having late or no prenatal care among all mothers in Davidson County (6.3%).

Figure 9. Risk Factors Associated with Infant Deaths, All Causes, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

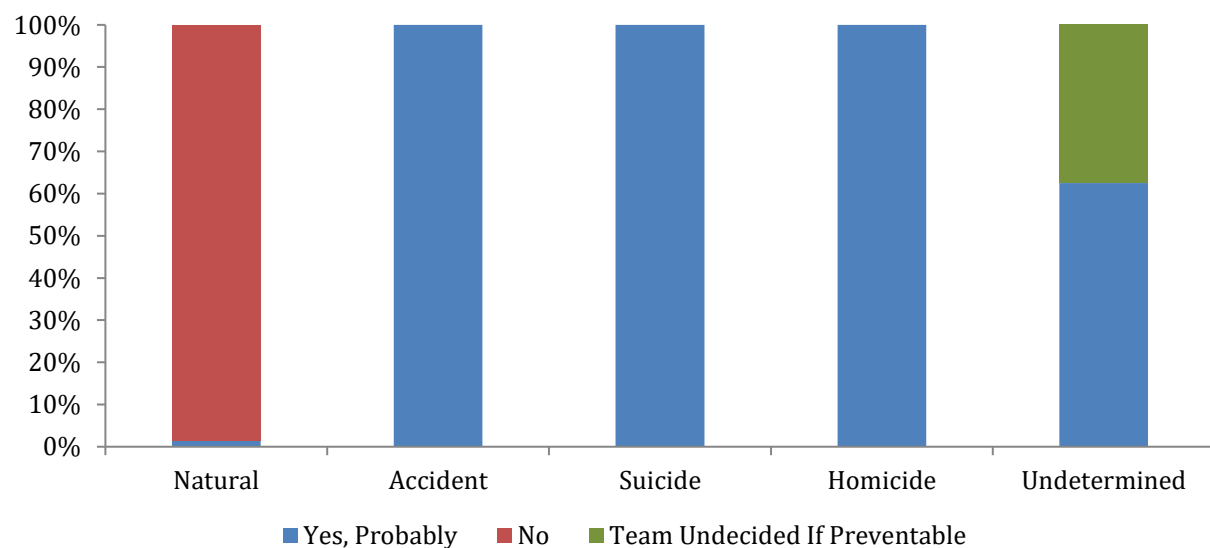
Approximately 20% of total infant deaths in 2018 in Davidson County were sleep-related (12 deaths). These deaths were primarily related to the sleeping environment, such as co-sleeping and sleeping in soft bedding. Practicing safe sleep habits for infants should be a key component of future interventions to reduce infant mortality. A more detailed examination of sleep-related infant deaths is provided later in this report.

Preventability

The CDRT carefully reviewed each death in order to determine if the death was preventable. A death is deemed preventable if an individual or a community could have identified and modified risk factors and reasonably changed the circumstances leading to death.

The CDRT determined that 31 (31.6%) of the total 98 deaths reviewed in 2018 were probably preventable. Figure 10 displays the proportion of preventable deaths by manner of death. Most preventable deaths were injury-related such as suicides, homicides, motor vehicle crashes, fires, poisonings, and drownings. Additionally, sleep-related infant deaths were also regarded as preventable, for which the manner of death was often classified as accidental or undetermined.

Figure 10. Reviewed Child Deaths by Manner of Death and Preventability, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

Detailed Review of Deaths by Manner and Cause

As stated previously in this report, certifying physicians or medical examiners classified deaths into 1 of 5 manners of death: natural, accident, homicide, suicide, or undetermined. The frequency distribution of deaths by manner is discussed earlier in this report (Figure 3, Table 2). The following sections describe the specific causes of death within each manner.

Deaths Due to Natural Causes

A total of 65 deaths reviewed by the CDRT in 2018 were due to natural causes. As shown in Table 3, 72.3% of those deaths occurred to infants, 56.9% occurred to females, and 44.6% occurred to NHB children - the highest percentage when compared to other race/ethnic groups. The leading causes of deaths were congenital anomalies (26 deaths, 40%), and prematurity (23 deaths, 35.4%). Cancers contributed 4.6% (3 deaths). Other conditions (13 deaths) contributed 20% and included neurological conditions (3.1%), influenza (1.5%), pneumonia (1.5%), and asthma (1.5%).

Table 3. Number of Reviewed Deaths Due to Natural Causes by Specific Cause, Summary for Children Aged 0-17 Years, Davidson County, TN, 2018

Natural Causes of Death						
	Total (n=65)	% of Reviewed Deaths	Congenital Anomaly (n=26)	Prematurity (n=23)	Cancer (n=3)	Other Causes (n=13)
Age Group						
<1 yr	47	72.3	19	23	0	5
1-4 yrs	8	12.3	4	0	1	3
5-9 yrs	3	4.6	3	0	0	0
10-14 yrs	6	9.2	0	0	2	4
15-17 yrs	1	1.5	0	0	0	1
Race/Ethnicity						
NHB	29	44.6	12	13	2	2
NHW	19	29.2	5	7	0	7
Asian	2	3.1	0	1	0	1
Hispanic	15	23.1	9	2	1	3
Sex						
Male	28	43.1	7	11	3	7
Female	37	56.9	19	12	0	6
Data Source: MPHD; Child Fatality Review Database System						

Deaths Due to Unintentional Injuries

The CDRT identified 12 deaths due to unintentional injury in 2018, representing 12.2% of the total reviewed deaths. The leading causes of deaths due to unintentional injury were suffocation (7 deaths, 58.3%) and drowning (3 deaths, 25%) (Table 4). The remaining deaths resulted from a motor vehicle crash (1 death, 8.3%), and environmental exposure (1 death, 8.3%). Male children (7 deaths, 58.3%), infants under 1 year of age (8 deaths, 66.7%), and NHB children (7 deaths, 58.3%) had the highest percentages of unintentional injury-related deaths compared to other subgroups.

Table 4. Number of Reviewed Deaths Due to Unintentional Injury by Cause, Summary for Children Aged 0-17 Years, Davidson County, TN, 2018

Deaths Due to Unintentional Injury						
	Total (n=12)	% of Reviewed Deaths	Suffocation (n=7)	Drowning (n=3)	Motor Vehicle (n=1)	Environmental Exposure (n=1)
Age Group						
<1 yr	8	66.7	7	1	0	0
1-4 yrs	3	25.0	0	1	1	1
5-9 yrs	0	0.0	0	0	0	0
10-14 yrs	0	0.0	0	0	0	0
15-17 yrs	1	8.3	0	1	0	0
Race/Ethnicity						
NHB	7	58.3	4	2	0	1
NHW	4	33.3	2	1	1	0
Asian	0	0.0	0	0	0	0
Hispanic	1	8.3	1	0	0	0
Sex						
Male	7	58.3	4	3	0	0
Female	5	41.7	3	0	1	1

Data Source: MPHD; Child Fatality Review Database System

Motor Vehicle

The CDRT reviewed 1 death due to a motor vehicle accident. The child was a pedestrian struck by a vehicle. Poor line of sight was cited as a contributing factor.

Drowning

Of the 3 drowning deaths reviewed, 1 occurred in a river, 1 in a swimming pool, and 1 in a bathtub. Lack of proper supervision was noted in 2 incidents, and in 1 incident, the adult supervisor was impaired. Flotation devices were not used in the pool or river incidents, and a bath aid was absent in the bathtub incident. In 1 incident, the child was noted to have a significant chronic medical condition.

Suffocation

The CDRT reviewed 6 child deaths due to accidental suffocation, all of which were sleep-related. One additional death occurred to a child who choked on a toy, where the Heimlich maneuver was not attempted.

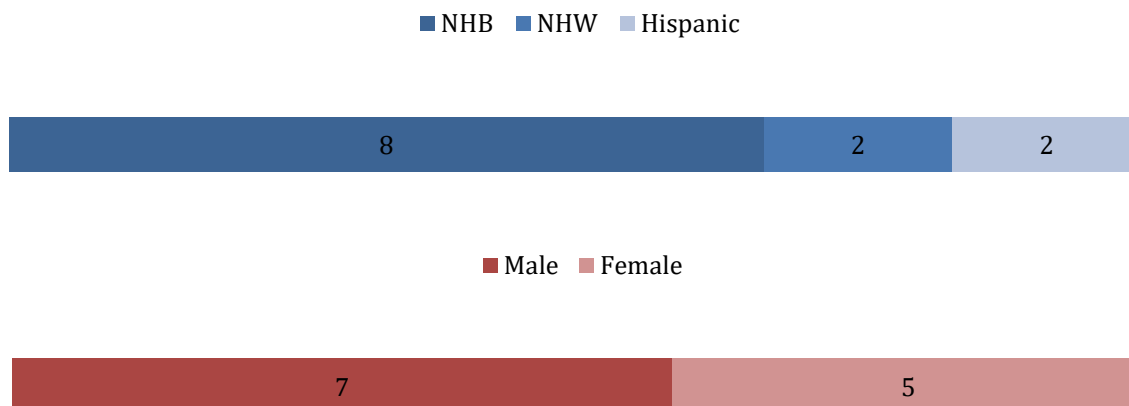
Exposure

One child died of heat exposure after being left unattended in a vehicle for an extended period of time.

Infant Deaths Due to Sleep-Related Factors

Of the 62 infant deaths reviewed by the CDRT in 2018, 12 (19.4%) were determined to be sleep-related. Of these 12 deaths, over half (8 deaths) occurred to NHB infants, and 2 deaths each occurred to NHW and Hispanic infants. The majority (7 deaths) occurred to male children (Figure 11).

Figure 11. Demographic Distribution of Sleep-Related Infant Deaths, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

Table 5 displays the frequency of selected sleep-related factors that contributed to the deaths. **With regards to sleeping places, 91.7% of the sleep-related deaths occurred in unsafe bedding, and 66.7% of these deaths occurred when the child was sleeping somewhere other than a crib or bassinette.** Other places where sleep-related infant deaths occurred were an adult bed (33.3%), a couch (8.3%), a futon (8.3%), and a bouncy chair (8.3%). A crib or other safe place to sleep was available in the home in 83.3% of cases. In 33.3% of cases, the home was overcrowded, which may significantly reduce the space available for a crib or pack-n-play placement.

Table 5. Selected Factors Involved in Sleep-Related Infant Deaths, Davidson County, TN, 2018

Factors Involved in Sleep-Related Infant Deaths		
	Total (n=12)	% of Reviewed Deaths
Sleeping in unsafe bedding	11	91.7
Not in a crib or bassinette	8	66.7
Not sleeping on the back	5	41.7
Sleeping with other people	4	33.3
Crib present in the home	10	83.3
Exposed to second-hand smoke	7	58.3
Residence overcrowded	4	33.3
Supervising adult was drug-impaired	0	0.0

Categories are not mutually exclusive

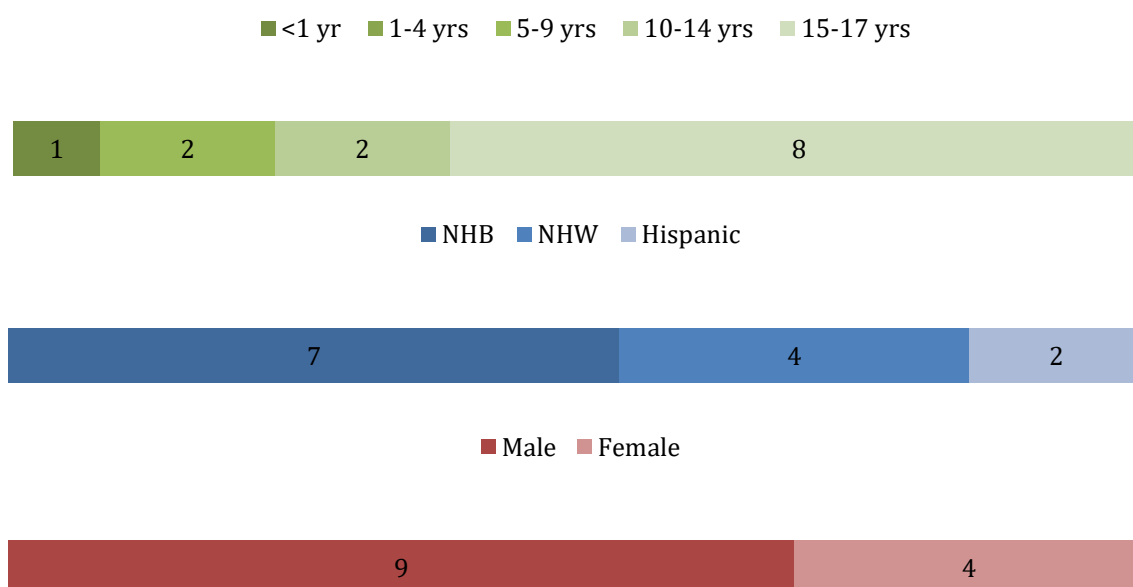
Data Source: MPHD; Child Fatality Review Database System

Additionally, 41.7% of infants were not sleeping on their backs, and 33.3% were sleeping with other people at the time of death. Over half (58.3%) of the reviewed infants were often or regularly exposed to second-hand smoke in the home. None of the infants were under the care of a drug-impaired adult at the time of death.

Deaths Due to Violence—Homicides and Suicides

The CDRT identified 13 deaths (13.3% of all reviewed deaths) that occurred to children in Davidson County in 2018 as the result of violence. Over half of the violence-related deaths occurred to teens aged 15 to 17 years (8 deaths). Most of the deaths occurred to males (9 deaths), and approximately half of the deaths occurred to NHB children (7 deaths) (Figure 12). Regarding the mechanism of death, violence-related deaths consist of homicides and suicides, which are described in detail below. A single death may have multiple contributing factors; therefore, the categories are not mutually exclusive.

Figure 12. Demographic Distribution of Violent Deaths for Children Aged 0-17 Years, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

Homicides

In 2018, 10 deaths were due to homicide, representing 76.9% of deaths due to violence and 10.2% of all reviewed deaths. The majority of these deaths occurred to NHB children (6 deaths), males (7 deaths), and youth aged 15 to 17 years (6 deaths).

Firearms were used in 8 incidents, physical violence in 1 incident, and a vehicle in 1 incident. Motives for the homicides included arguments (4 deaths), commission of a crime (2 deaths), playing with the weapon (2 deaths), revenge (1 death), and intimidation (1 death). One death resulted from a drive-by shooting, 1 from random violence, 1 from gang-related activity, and in 2 incidents, the victim was an innocent bystander. In 3 incidents, the detailed review indicated that the perpetrator of the homicide had a history of previous weapon offenses.

Most of the homicides were committed by someone known to the victim. Acquaintances were cited most frequently (4 incidents), followed by siblings (2 incidents), friends of the victim (2 incidents), and a babysitter (1 incident). Strangers to the victim were cited in 1 incident.

Weapon use was commonly noted to occur during the commission of another crime (6 incidents). The most frequently cited crimes were drug trafficking (4 deaths), robbery (2 deaths), and gang conflict (2 deaths).

Detailed reviews indicated that the victims were often experiencing 1 or more behavioral, social, or school-related issues prior to death. The victim was noted to have problems in school in 8 deaths. Truancy was noted most frequently (8 incidents), followed by behavioral issues (7 deaths), suspensions (7 deaths), and academic issues (4 deaths). Additional issues cited included substance abuse (6 incidents), a history of child maltreatment (1 incident), a history of criminal or delinquent activity (4 incidents), and homelessness (1 death).

In 7 (70%) of the 10 homicide deaths, the victims and/or their families were receiving services from public agencies prior to death: 6 had received mental health services, and the Department of Children's Services (DCS) was noted to be involved with 3 families (e.g., investigating allegations of child abuse and neglect, providing foster-care or family preservation services, or ensuring child safety).

Suicides

There were 3 suicide deaths involving children 0-17 years in 2018, representing 23.1% of all deaths due to violence and 3.1% of all deaths reviewed. The majority of suicide deaths occurred to teens aged 15 to 17 years (2 deaths), NHW children (2 deaths), and males (2 deaths).

With regards to mechanisms of death, two deaths were due to strangulation and 1 death was due to firearm.

One victim reportedly talked about suicide prior to death, and 2 victims had a history of prior suicide threats. Family and friends reported that the suicide was completely unexpected in 2 deaths.

Although motives for the suicide were not always apparent to the review team, available information suggests that argument with a significant other, history of depression, and experience of child maltreatment were potential triggers.

Similar to homicide victims, suicide victims were noted to have social, behavioral, or school problems prior to death. Academic issues were cited most frequently (3 incidents), followed by truancy (2 incidents), behavioral issues (2 incidents), and suspension from

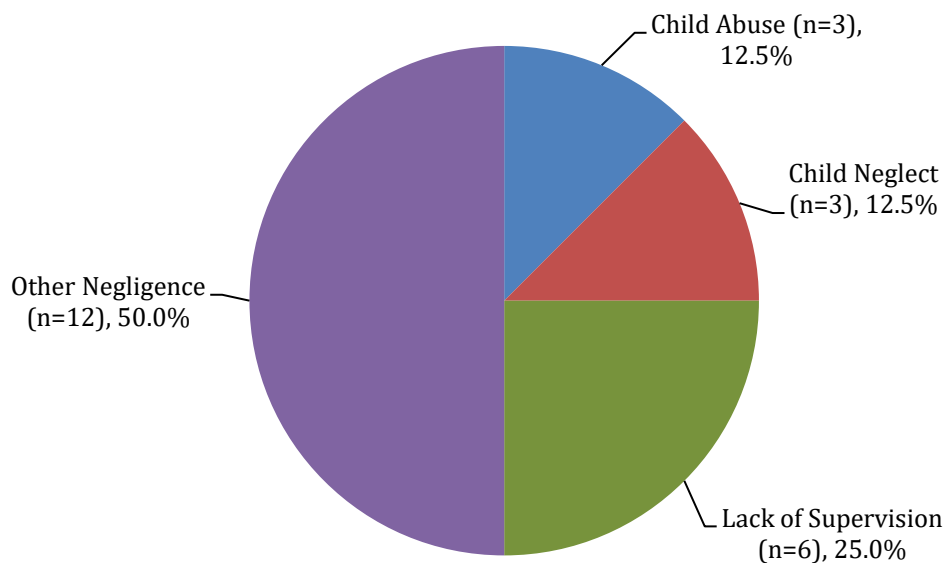
school (2 incidents). Additional issues cited included substance abuse (1 incident), and involvement with the foster care system (1 incident).

In 2 suicide deaths, the victims and their families were receiving services provided by public agencies: 2 had received mental health services, and DCS was noted to be involved with 1 family prior to the death of the child.

Child Abuse and Neglect

In reviewing child deaths occurring in 2018, the CDRT found 24 deaths (24.5%) having some evidence of abuse, neglect, or some other form of negligence. Of those deaths, 12.5% involved child abuse, 12.5% involved child neglect, 25% involved a lack of proper supervision, and 50% involved other negligence such as having an unsecured firearm in the home, maternal drug use during pregnancy, or unsafe bedding (Figure 13).

Figure 13. Percentage of Deaths with Evidence of Maltreatment by Type, Davidson County, TN, 2018



Data Source: MPHD, Child Fatality Review Database System

Table 6 displays the demographic information for reviewed deaths associated with child abuse, child neglect, lack of supervision, or other negligence. The majority of these deaths occurred to infants (70.8%), NHB children (66.7%), and males (54.2%).

Table 6. Number of Reviewed Deaths with Evidence of Child Maltreatment among Children Aged 0-17 Years, Davidson County, TN, 2018

Deaths with Evidence of Maltreatment (n=24)		
	Total	% of Reviewed Deaths
Age Group		
<1 yr	17	70.8
1-4 yrs	4	16.7
5-9 yrs	2	8.3
10-14 yrs	0	0.0
15-17 yrs	1	4.2
Race/Ethnicity		
NHB	16	66.7
NHW	5	20.8
Asian	0	0.0
Hispanic	3	12.5
Sex		
Male	13	54.2
Female	11	45.8

Data Source: MPHD, Child Fatality Review Database System

In 75% of the deaths, the perpetrator was the child's biological parent or primary caregiver. Other perpetrators cited included the child's supervisor at the time of death (12.5%) and other relatives (8.3%). In 16.7% of the deaths, the person causing or contributing to the death of the child was drug or alcohol-impaired. DCS was involved with the family prior to death in 16.7% of the deaths (Data not shown).

Conclusion

The CDRT strives to understand both the magnitude and the causes of death among Davidson County's children in order to identify strategies and systems changes that might help prevent future tragic outcomes. The data contained in this report highlights several key areas that warrant further attention and indicate a need for the community to prioritize childhood mortality as a strategic focus. For example, the child mortality rate in Davidson County was almost unchanged since 2015 and was consistently higher than the rate for the State of Tennessee and the nation. Additionally, disparities in overall child mortality and infant mortality between NHB and NHW children were persistent over time. Lastly, a third of the total reviewed deaths were determined to be preventable, including approximately 20% of all infant deaths, which were related to unsafe sleep environments or practices.

Reviews have also identified key areas for future interventions to reduce the number of preventable deaths. These include, but are not limited to, efforts to increase first-trimester prenatal care utilization, interventions to increase the utilization of safe sleep practices among infants, and support of programs, policies, and practices in the community aimed at reducing violent deaths.

Technical Notes

Data Sources

The data presented in this report are compiled from many different sources, and as such, errors in the data are more readily identified and corrected through the review process. For this reason, the data presented in this report might differ from data published from other sources.

Data from reviews are abstracted into a standard data collection form and entered into a database hosted by The National Center for Fatality Review and Prevention.

National and State level comparison data are from the National Vital Statistics System Database, CDC WONDER, and reports from the Tennessee Child Fatality Review Team.

Childhood and infant mortality rates were calculated from the Davidson County vital records files; those estimates include deaths excluded from CDRT review. Population estimates are from the American Community Survey; single-year estimates are used to calculate child mortality rates where appropriate. Infant mortality rates are calculated from the total number of infant deaths divided by the total number of live births.

Data Limitations

The indicators in this report are based on county-level data, and as such, the numbers can be small. Rates based on counts less than 20 are considered unstable and should be interpreted with caution; percentages and rates may change drastically from year to year.

Data Interpretation

Death is the final outcome of a continuum of circumstances, and the data collected by the CDRT represents this extreme. Therefore, caution should be used when extrapolating these results to the general population. However, the data collected by the CDRT illustrates areas where the systems, policies, and practices of a community fail to protect children adequately. As such, this information provides valuable evidence to promote and advocate for systems change.

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Appendix

Appendix 1. Organizations and Agencies Serving on the Child Death Review Team

Participating Organizations	
Metro Public Health Department	Monroe Carrell Jr. Children's Hospital at Vanderbilt
Metro Nashville Police Department	Vanderbilt University Medical Center
Metro Nashville Public Schools	St. Thomas Midtown Hospital
Metro Office of Family Safety	TriStar Centennial Medical Center
Office of the District Attorney Nashville	Metro Nashville General Hospital
Juvenile Court of Metropolitan Nashville and Davidson County	Children's Clinic East
Nashville Fire Department	Mednax
Davidson County Medical Examiner's Office	Nurses for Newborns
Department of Children's Services	Prevent Child Abuse Tennessee
Tennessee Suicide Prevention Network	Child Protective Investigative Team